

## ABSTRACT

An optical waveguide is disclosed in which a section of the waveguide core is vertically tapered during formation by spin coating by controlling the width of an underlying mesa structure. The optical waveguide can be formed from spin-coatable materials such as polymers, sol-gels and spin-on glasses. The vertically-tapered waveguide section can be used to provide a vertical expansion of an optical mode of light within the optical waveguide. A laterally-tapered section can be added adjacent to the vertically-tapered section to provide for a lateral expansion of the optical mode, thereby forming an optical spot-size transformer for efficient coupling of light between the optical waveguide and a single-mode optical fiber. Such a spot-size transformer can also be added to a III-V semiconductor device by post processing.